

WHAT IS CLAIMED IS:

1. An operation microscope having a microscope
body including an optical eyepiece system for
stereoscopically observing an operative portion of
5 a surgical operation, said microscope comprising:
 - a microscope image observer for observing an
observation image formed for stereoscopic observation
by the microscope body;
 - 10 a plurality of image forming sections for forming
images other than the observation image of said
microscope image observer;
 - an image display for selectively displaying the
respective images of said plurality of image forming
sections in said microscope image observer;
 - 15 a display driver for controlling display states of
the plurality of images formed by said plurality of
image forming sections independently of one another;
and
 - a controller for controlling an operation of the
20 display driver.
2. The operation microscope according to claim 1,
wherein said image display comprises:
 - an in-field display for displaying the image of
any one of said image forming sections in a field of
25 the observation image of said microscope image
observer; and
 - an out-of-field display for displaying the image

of said image forming section other than the image
of said in-field display outside the field of the
observation image of said microscope image observer.

3. The operation microscope according to claim 2,
5 wherein said in-field display is formed by a small
screen display, formed by cutting a part of the field
of the observation image of said microscope image
observer, for displaying another image formed by said
image forming section in the cut part.

10 4. The operation microscope according to claim 2,
wherein said in-field display is formed by an image
superimposing section for superimposing and displaying
the image other than said observation image in the
field of the observation image of said microscope image
15 observer.

5. The operation microscope according to claim 2,
wherein said in-field display comprises:

a small screen display, formed by cutting a part
of the field of the observation image of said
20 microscope image observer, for displaying another image
formed by said image forming section in the cut part;
and

an image superimposing section for superimposing
and displaying the image other than said observation
25 image and the display image of said small screen
display in the field of the observation image of said
microscope image observer.

6. The operation microscope according to claim 1,
wherein said image display comprises:

an in-field display for displaying the image of
any one of said image forming sections in a field of
5 the observation image of said microscope image
observer, and

said in-field display comprises:

a small screen display, formed by cutting a part
of the field of the observation image of said
10 microscope image observer, for displaying another image
formed by said image forming section in the cut part;
and

an image superimposing section for superimposing
and displaying the image other than said observation
15 image and the image of said small screen display in the
field of the observation image of said microscope image
observer.

7. The operation microscope according to claim 1,
wherein said display driver comprises:

20 an image selector for selecting respective display
images of said plurality of image forming sections;

a display controller for displaying the image
selected by said image selector in said corresponding
image display; and

25 an operation input section for operating said
display controller and the image selector.

8. The operation microscope according to claim 7,

wherein said operation input section comprises:

detection means for detecting an image source
state of said plurality of image forming sections; and
an automatic controller for automatically

5 controlling at least one of said display controller and
said image selector based on a detection result of the
detection means.

9. The operation microscope according to claim 1,
wherein said plurality of image forming sections
10 comprise:

an endoscope image forming section for forming the
observation image by an endoscope;

a navigation image forming section, provided with
a diagnosis image memory apparatus incorporated
15 therein, for forming a navigation image by a navigation
apparatus including correlation processing means for
calculating a correlation between the diagnosis image
and the observation image of said microscope image
observer;

20 an image data forming section for forming
character data and various image data such as an arrow;
and

an operation information data forming section for
forming operation information data for displaying
25 operation information of said operator.

10. The operation microscope according to claim 5,
wherein said display driver comprises an XY driver for

driving said small screen display in an XY direction in XY coordinates crossing at right angles to each other in the field of the observation image of said microscope image observer, and

5 said controller comprises:

 an XY direction operation switch for operating said XY driver in said XY direction;

 an image selection switch for selecting the respective images of said plurality of image forming sections; and

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 a display selection switch for selecting said image display.

11. The operation microscope according to claim 7, wherein said image forming section comprises a nerve monitor for inspecting a function of a cranial nerve, and displaying an inspection result with a waveform, and

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 said image selector comprises waveform monitor means of said nerve monitor, and changes a display state of said nerve monitor in accordance with a state of the waveform monitor means.

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12. The operation microscope according to claim 3, wherein said microscope is connected to an external operation input section disposed outside an operating theater, and comprises a data transmitter for displaying an instruction from said external operation input section in said small screen display.

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13. The operation microscope according to claim 7,
wherein said image forming section comprises a menu
image forming section for forming a menu image by which
an image to be displayed in said image display is
5 selected, and

said image selector comprises a selection section
of a menu display position for selecting a display
place of said menu image in accordance with the display
state of the image displayed in said image display.

10 14. The operation microscope according to claim 4,
wherein said microscope comprises a TV camera for
picking up the observation image of said microscope
image observer,

an image pickup range of said TV camera is set to
15 be smaller than an image superimposing range of said
image superimposing section, and

said display driver superimposes information
necessary after the surgical operation in said camera
image pickup range, and displays information necessary
20 only during the surgical operation outside said camera
image pickup range.

15. The operation microscope according to claim 2,
wherein said microscope comprises:

a holder for movably supporting said microscope
25 body; and

a holder fixing section for fixing a moving
position of the holder in such a manner that the moving

position can be fixed or released, and

said image display changes a display mode of
a plurality of display images of said in-field display
in accordance with a state of said holder fixing
5 section.

16. The operation microscope according to claim 2,
wherein said image forming section comprises an
ultrasonic observation image forming section for
forming an image indicating an observation result of
10 an ultrasonic observation apparatus, and

said image selector detects an observation/non-
observation state of said ultrasonic observation
apparatus, and changes a display mode of a plurality of
display images of said in-field display in accordance
15 with the state.

17. The operation microscope according to claim 6,
wherein said microscope comprises a foot switch for
controlling an operation, and

said display driver allots a function of said
20 foot switch to image source control in accordance with
an image source selected by said in-field display.

18. The operation microscope according to
claim 17, wherein said display driver comprises a
display for displaying an identification mark in the
25 image to which the function of said foot switch is
allotted in accordance with the image source selected
by said in-field display.

19. The operation microscope according to claim 6, wherein said microscope body comprises an endoscope holding hook for holding an endoscope so that the endoscope is attachable or detachable, and

5 said display driver detects whether or not said endoscope is held by said endoscope holding hook and controls said image display.

20. The operation microscope according to claim 2, wherein said image forming section comprises a scale display for calculating an image scale of said
10 endoscope and displaying the image scale in said in-field display.

21. The operation microscope according to claim 20, wherein said scale display calculates a scale
15 of the observation image of said microscope image observer and overlays and displays the scale in the observation image of said microscope image observer.

22. The operation microscope according to claim 20, wherein said scale display comprises
20 a stereoscopic index display for displaying a stereoscopic index in said in-field display.

23. The operation microscope according to claim 9, wherein said image forming section displays an image of an ultrasonic probe and said navigation image in said
25 image display with a progress of the surgical operation when said ultrasonic probe is used.

24. The operation microscope according to

claim 23, wherein said ultrasonic probe changes an image display direction in accordance with an insertion direction of the ultrasonic probe of a front scan.

25. The operation microscope according to claim 2,
5 wherein said out-of-field display is disconnectably connected to said microscope body.